separately;

first and second inlets formed for said sealing agent;

a liquid crystal material incorporated between said first and second substrates via said first inlet; and

a resin material charged between said first and second substrates via said second inlet, said resin material contacting with said second substrate and covering said drive circuit region;

wherein a distance between said first and second substrates being larger than a thickness of said drive circuit and said second substrate is extended to oppose both of said display region and said drive circuit region provided on the first substrate.

24. The device of claim 23 wherein said sealing agent contains spacers.--

REMARKS

This amendment responds to the Official Action mailed September 7, 1995. Claims 1-20 were pending. In this submission, independent claims 1, 6, 11 and 16 have been amended in order to more clearly define protection to which applicant is entitled. New claims 21-24 are submitted for examination on the merits. Accordingly, claims 1-24 are now pending in the present application and, for the reasons set forth below, are believed to be in condition for allowance.

SUMMARY OF THE INVENTION

The present invention relates generally to an electro-optical display

device comprising both a display region and a drive circuit region on a single substrate, in which the drive circuit region is protected against external forces. More particularly, claim 1 discloses a first substrate having a display region and a drive circuit region which includes a drive circuit for controlling the display in the display region, wherein these regions are partitioned by a sealing agent. A second substrate is also provided opposed to the first substrate with a liquid crystal material incorporated between the two substrates, wherein the second substrate opposed to the first substrate is extended to oppose both the display region and the drive circuit region provided on the first substrate to thereby provide protection against external forces. Furthermore, the distance between the first and second substrates is larger than the thickness of the drive circuit region.

Claim 6 is similar to claim 1, however, it further recites that the sealing agent surrounds the drive circuit region. Claim 11 is similar to claim 1, however, it further recites a resin material positioned between the two substrates, wherein the resin material covers the drive circuit region and also contacts the second substrate. Claim 16 is similar to claim 11, however, it further recites that the sealing agent surrounds the drive circuit region.

PRIOR ART REJECTIONS

The Official Action rejects claims 1 and 5 as anticipated by U.S. Patent 4,394,067 to Spruijt et al. This rejection is respectfully traversed in view of the amendments herein, and reconsideration is requested based on the following remarks.

The Official Action asserts that Spruijt et al. shows a first substrate having a display region and a drive circuit region, a second substrate opposed

to the first substrate and extended to oppose both the display and drive circuit regions on the first substrate, a sealing agent partitioning the regions, and a liquid crystal material incorporated between the substrates.

Amended claim 1 recites that the distance between the first and second substrates is larger than the thickness of the drive circuit region, as illustrated in Figures 3, 4, 5 and 6 of the present invention. However, Spruijt et al. shows that the distance between the first and second substrates is smaller than the thickness of the drive circuit region (IC-crystal 9), as described at Col. 1, lines 58-61. Accordingly, Spruijt et al. requires that a cavity be recessed in the second substrate in order to accommodate the IC-crystal, wherein the cavity is formed by ultrasonic drilling (Col. 1, lines 61-64). Therefore, the fabricating process of the display device in Spruijt et al. is quite complicated. Whereas, in the present invention, there are no complicated processes required, such as ultrasonic drilling, in forming the display device, because the distance between the first and second substrates is larger than the thickness of the drive circuit region. Hence, applicants believe that claims 1 and 5 are not anticipated by Spruijt et al. and reconsideration in view of the amended claim language is respectfully requested.

Claims 1, 3-6, 8-11, 13-16 and 18-20 were rejected as obvious based on the combination of the alleged admissions of prior art and Spruijt et al. This rejection is respectfully traversed in view of the amendments herein, and reconsideration is requested based on the following remarks.

The applicant's description of prior art on pages 1-2 of the subject application is relied upon for the general teaching of forming a conventional liquid crystal display, wherein a display region and drive circuit region are provided on a first substrate and a second substrate is extended to cover only

the display region and not the drive circuit region. The Official Action asserts it would have been obvious to extend the second substrate, in the conventional display described by the applicants, to oppose the drive circuit region as disclosed in Spruijt et al.

However, in view of the amendments herein, it can be seen that this combination of prior art does not produce the claimed invention. The applicant's prior art disclosure does not show the second substrate extending over the drive circuit region. The second substrate in Spruijt et al. requires alteration, such as by forming a cavity therein to accommodate the drive circuit, in order to have the second substrate extend over the drive circuit region on the first substrate. Additionally, nothing of the prior art shows that the distance between the two substrates should be larger than the thickness of the drive circuit region. Therefore, the combination of prior art does not produce the claimed invention.

With regard to claims 6 and 8-10, the Official Action asserts it would have been obvious to use an epoxy resin in a conventional display, as described in applicant's disclosure that a resin material is conventionally formed over the drive circuit (on page 2 of the subject application), as modified by the teachings of Spruijt et al. However, as described above, nothing in the prior art discloses that the distance between the first and second substrates is larger than the thickness of the drive circuit region, wherein a sealing agent further surrounds the drive circuit region. In *In re Dillon*, 16 U.S.P.Q.2d 1897 (1990), the full Court of Appeals for the Federal Circuit held that in making an obviousness rejection, the Patent Office must make a prima facie case of obviousness, including both (1) a showing of structural similarity between one or more prior art references and the claimed invention, and (2)

some specific motivation in the prior art references for combining the references in the manner asserted. Applicants respectfully assert that neither prong of this test has been satisfied. Spruijt et al. is entirely different from the claimed invention, because it does not disclose surrounding the drive circuit region with a sealing agent and actually teaches away from the invention by requiring the thickness of the drive circuit region to be larger than the distance between substrates )Col. 1, lines 58-61). The applicants have found that by surrounding the drive circuit region with a sealing agent while the drive circuit region is also covered by the second substrate, the drive circuit can be effectively protection from transformation of the substrate during fabrication. Furthermore, with regard to new claims 21-24, the applicants have found that when the sealing material contains spacers, the drive circuit can be protected more effectively. Accordingly, not only does the combination of prior art does not produce the claimed invention, but one of ordinary skill in the art would not be motivated to combine these references to obtain the claimed invention since Spruijt et al. teaches away from the claimed invention.

With respect to claims 11, 13-16 and 18-20, nothing in the prior art discloses a resin material covering a drive circuit region while also contacting a second substrate opposing the drive circuit region. The applicants have found that by having the resin material contacting the second substrate, the drive circuit can be effectively protected from transformation of the substrate during fabrication. It is respectfully submitted that this combination of references fails to make out a prima facie case of obviousness, because the combination does not produce the invention recited in the amended claims of having the resin material covering the drive circuit region while also contacting the second substrate.

The Official Action further asserts that claims 4, 5, 9, 14 and 19 are obvious based on the applicant's disclosed prior art in the subject application in view of Spruijt et al. Because these claims ultimately depend on independent claims 1, 6, 11 and 16 and these references fail to disclose the use MIM diodes as a display region or a matrix of electrodes as a display region, one skilled in the art would not be motivated to combine these references to yield the present invention. These rejections are respectfully traversed in view of the amendments herein to their respective independent claims, and reconsideration is requested in view of the arguments discussed herein for placing the independent claims in a condition for allowance.

Additionally, the Official Action stated that claims 2, 7, 12 and 17 would be allowable if rewritten to overcome the rejection under 35 U.S.C. § 112 and to include all of the limitations of their base claims and any intervening claims. However, there was no § 112 rejection in the Official Action regarding these claims. Furthermore, for the reasons stated above, in view of the amendments herein, their respective independent claims 1, 6, 11 and 16 are believed to be in condition for allowance. Therefore, claims 2, 7, 12 and 17 are also now believed to be in condition for allowance.

FORMALITIES

The Official Action further rejects claims 5 and 10 as indefinite. In these claims, the Official Action asserts that the phrase "a simple matrix electrodes" is unclear, and the Official Action suggests the phrase be changed to --a matrix of electrodes--. By the above amendment, the Applicants have incorporated this change into claims 5 and 10 to overcome the noted rejection.

CONCLUSION

In each case, the pending rejections should be reconsidered in view of the amendments and remarks herein. Applicants believe that this case is in good condition for allowance, and a Notice of Allowance is earnestly solicited. If a telephone or further personal conference would be helpful, the Examiner is invited to call the undersigned, who will cooperate in any appropriate manner to advance prosecution.

Respectfully submitted,

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